CLEANBURST™

RAPID ACOUSTIC LYSIS FOR POINT-OF-CARE DIAGNOSTICS

Sandia National Laboratories

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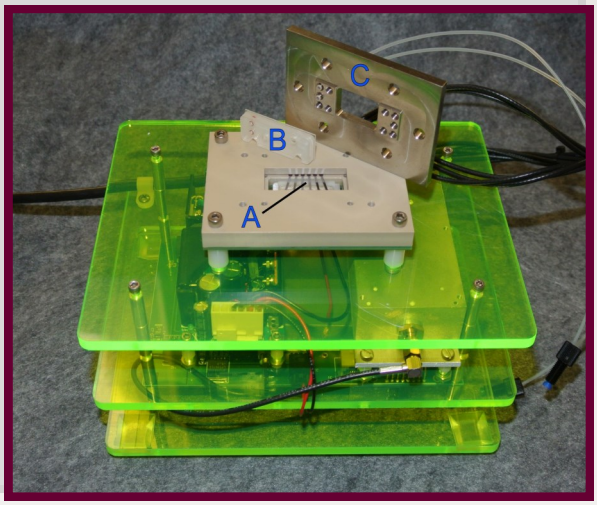
TECHNOLOGY SUMMARY

US PATENT PENDING

Most biosensors in today's market and in R&D require a critical sample preparation procedure prior to analysis of cellular contents such as nucleic acids and proteins. Technology is needed to release the cellular contents in a format compatible with nano/microfluidic and Point-of-Care (POC) devices.

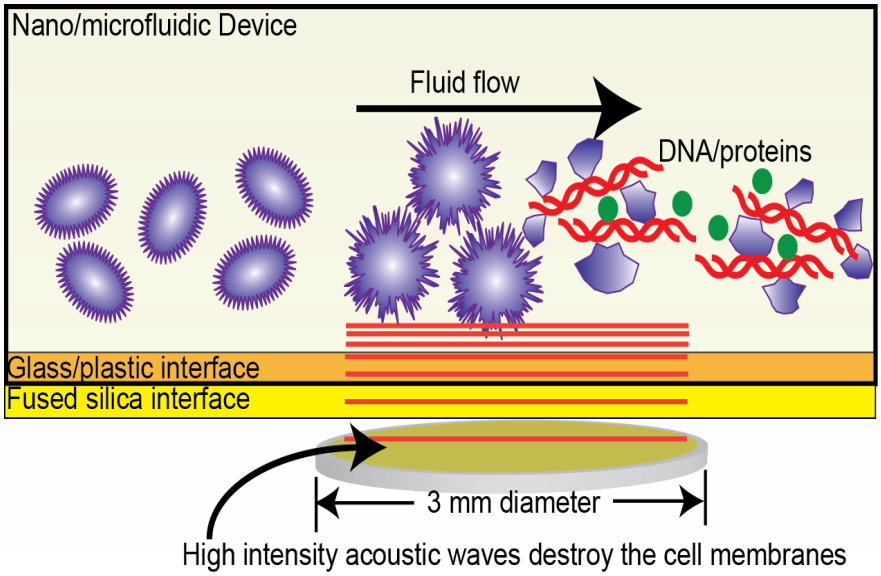
Sandia National Laboratories has developed a miniature cell lysis system to overcome the limitations of current extraction methods. This system utilizes high-frequency compression waves with a wavelength similar to the size of cells, resulting in more efficient energy transfer. Unlike commercial acoustic transducers, our technology does not generate significant amounts of heat, making it compatible with protein assays. This technology releases viable DNA, RNA, and proteins from human or bacterial cells, without chemicals or additional processing, to enable high-speed sample preparation for clinical point-of-care (POC) medical diagnostics and use with nano/microfluidic devices.



CleanBurst System

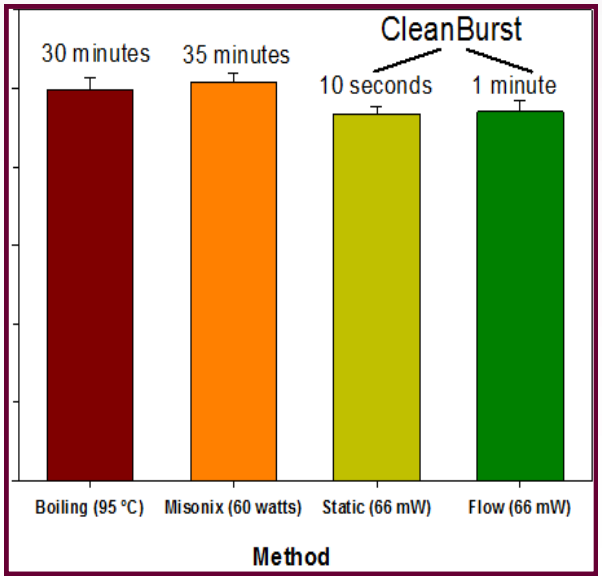
(A) five channel acoustic array that couples reversibly to user-specified nano/microfluidic devices **(B)**. The nano/microfluidic device **(B)** reversibly couples to **(A).** A plate **(C)** holds the nano/microfluidic device in contact with the acoustic array while also making microfluidic connections.

How It Works



Performance Comparison

Mycobacterium Tuberculosis (MTB) Lysing Efficiency Versus Other Common Methods



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POTENTIAL APPLICATIONS

Same-Day Pathogen Diagnosis

Species-Specific Drug Prescriptions

Lysing of Resilient Cells

Bio-Agent Identification

Rapid DNA testing

TECHNOLOGICAL BENEFITS

No harsh chemicals or purification needed

Generates PCR-ready DNA

Disrupts the cellular membranes of even the most difficult bacteria in seconds

Reusable

Suitable for processing volumes ranging from 1-1000 µL

TECHNOLOGY READINESS LEVEL

6

Representative elements have been demonstrated in relevant environments.

CONTACT INFORMATION

For more information or to discuss licensing opportunities please contact us at ip@sandia.gov.

Refer to SD # 11592

Or to learn more, please visit our website at https://ip.sandia.gov.

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